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FEDERAL - STATE COOPERATIVE SNOW SURVEYS and WATER SUPPLY FORECASTS

# Colorado, Rio Grande, Platte, and Arkansas Drainage Basins

UNITED STATES DEPARTMENT of AGRICULTURE ... SOIL CONSERVATION SERVICE.

COLORADO AGRICULTURAL EXPERIMENT STATION and STATE ENGINEER of NEW MEXICO

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, National Park Service, Bureau of Reclamation, State Engineers of Colorado and Wyoming; and other Federal, State and local organizations.

MAY 1, 1957

# UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

Snow surveys in the West are conducted each year at more than 1200 snow courses. Basin and Province or State snow survey reports summarizing the results of the measurements and forecasts of seasonal runoff and water supply are issued by the soil Conservation Service, U. S. Department of Agriculture and some of its cooperators; the Water Rights Branch of the British Columbia Department of Lands and Forests; and the California Division of Water Resources.

Copies of the various federal-state cooperative snow survey reports listed below may be secured by writing to:

Head, Water Supply Forecasting Section Soil Conservation Service 209 S. W. 5th Avenue Portland 4, Oregon

#### BASIN REPORTS:

Colorado, Rio Grande...Issued monthly February through May by SCS and and Platte-Arkansas Colorado Experiment Station, Fort Collins, Colorado.\*

River Basins

Columbia River......Issued monthly January through May by Soil Conserva-Basin tion Service, Boise, Idaho,\*

Upper Missouri...... Issued monthly February through May by SCS and
River Basin Montana Agricultural Experiment Station, Bozeman,
Montana. \*

West-Wide Water...... Issued April 1 by Soil Conservation Service and Supply Outlook Cooperators, Portland, Oregon.

#### STATE REPORTS:

Arizona...... Issued semi-monthly January 15 through April 1 by SCS and Salt River Valley Water Users Association, Phoenix, Arizona.\*

Oregon...... Issued monthly January through May by SCS, Portland,
Oregon, and Oregon Agricultural Experiment Station.\*

Utah...... Issued monthly January through May by SCS, Salt Lake
City, Utah, and State Engineer of Utah and Utah Agricultural Experiment Station.\*

Washington...... Issued monthly February through May by SCS, Spokane,
Washington, and State Department of Conservation and
Development.\*

Wyoming..... Issued monthly February through May by SCS, Casper,
Wyoming, and State Engineer of Wyoming.\*

\*Special reports are issued as needed.

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The British Columbia reports are issued February 1 through June 1 and may be secured from Comptroller, Water Rights Branch, Department of Lands and Forests, Parliament Buildings, Victoria, B. C.

The California reports are issued monthly February 1 through May 1 and may be secured from Division of Water Resources, California Department of Public Works, Sacramento, California.

The annual water supply forecasts of the Weather Bureau are available in monthly bulletins published from January through May. These bulletins entitled, "Water Supply Forecasts for the Western United States" may be obtained from River Forecast Center, Weather Bureau, 712 Federal Office Building, Kansas City 6, Missouri.

#### FEDERAL-STATE COOPERATIVE

#### SNOW SURVEYS AND WATER SUPPLY FORECASTS

for

COLORADO RIVER, PLATTE RIVER ARKANSAS RIVER AND RIO GRANDE DRAINAGE BASINS

Issued

May 9, 1957

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United States Department of Agriculture
Soil Conservation Service
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Fort Collins, Colorado
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Denver, Colorado
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S. E. Reynolds State Engineer State of New Mexico

General Series Paper No. 654 Colorado Agricultural Experiment Station

Snow Survey measurements in Wyoming, Utah, and Arizona are supplied by Snow Survey Supervisors in those states.

# WATER SUPPLY OUTLOOK COLORADO, PLATTE, ARKANSAS AND RIO GRANDE DRAINAGE BASINS May 1, 1957

WATER SUPPLY OUTLOOK FOR COLORADO AND NEW MEXICO CONTINUED TO IMPROVE DURING APRIL AND IS DEFINITELY THE BEST SINCE 1952. SUPPLIES OF IRRIGATION WATER WILL BE GENERALLY ADEQUATE ON THE WESTERN SLOPE OF BOTH STATES. LIMITED SHORTAGES MAY OCCUR IN LATE SEASON ON THE LOWER SOUTH PLATTE AND ARKANSAS RIVER DEPENDING ON OPPORTUNITY TO REPLACE DEPLETED STORAGE RESERVES DURING THE PEAK OF SNOW MELT RUNOFF. FLOW OF THE RIO GRANDE AND TRIBUTARIES INTO SAN LUIS VALLEY SHOULD BE ABOVE NORMAL. THE FLOW OF THE RIO GRANDE THROUGH NEW MEXICO WILL BE LESS THAN NORMAL BUT WELL ABOVE THAT FOR ANY OF THE PAST FOUR YEARS. SURFACE WATER OUTLOOK FOR ARIZONA IS POOR.

Temperatures during the month of April were relatively cool. There was very little snow melt at high elevations. With no snow melt and above normal snow fall during the month of April, snow water contents measured May 1 in Colorado are near record highs for this date. In New Mexico snow melt has been about average and the amount of snow remaining at high elevations is typical for May 1. However, mountain soils under the snow are still dry in Colorado and this will have to be replaced before there is a material increase in stream flow. Seasonal flow of practically all streams in Colorado will be 10 to 15 percent above normal. The only shortages which may extend over a wide area will be in late season. Storage reserves have been depleted for several years. Late season water supply will depend on opportunities to replace this storage now and during the peak of snow melt. Heavy snow and rains on the eastern plains during April have eased the demands for direct flow along the Lower Platte and Arkansas Rivers so some opportunity for storage has been provided,

In summary, surface water supplies will be adequate for all of Colorado except for late season shortages below Kersey on the South Platte and La Junta on the Arkansas should summer rainfall be below normal. In San Luis Valley surface supplies should be reasonably adequate but not plentiful. A continued shortage is in view along the Rio Grande in New Mexico but supplies will be well above those of any of the past four years.

SOUTH PLATTE. Water supplies should be reasonably adequate over the entire South Platte Basin. Streamflow will be above normal near the mountains. In addition, a substantial amount of water will be available from the Colorado-Big Thompson project. Precipitation was well above normal during April on the plains and soil moisture conditions in irrigated areas is excellent. Snow fall was also far above normal in the mountains and snow pack is near a record high for this date. Soils under the snow remain dry. This moisture deficit will have to be replaced before the snow water will be available for runoff. Storage is below average in reservoirs serving the Sterling and Julesburg area and precipitation was not so heavy in the northeast part of the state. In this area of the South Platte late season shortage may occur and continued use of groundwater may be necessary.

ARKANSAS. The snow pack on the Arkansas River and its southern tributaries remains well above average. The flow of the main stream is expected to be normal or above for a short distance below Pueblo. Storage is very limited. Mild shortage of water may occur in late season unless there is rainfall concurrent with peak stream flow so that the storage for late season use may be replenished. Because of April storms, soil moisture over the valley area is the best on several years. Water supply outlook is the best since 1952 on the Arkansas and would be excellent if a reasonable amount of stored water was available.

RIO GRANDE. The water supply outlook for the Rio Grande is for 110 to 120 percent normal flow into San Luis Valley and 80 to 95 percent normal flow through New Mexico. Snow pack on the Colorado mountain section was well above average for May 1 this year but 10 to 20 percent less than that on May 1, 1952, the last heavy run-off year. Scils under the snow in Colorado are still dry at high elevations but are wet in Northern New Mexico. Water supply in the San Luis Valley should be reasonably adequate. Mild shortage may occur here in late season if there are restrictions on storing water under present operating arrangements. Even if stream flow through New Mexico is expected to approach average, water supplies will be much less than the present demands because of lack of reservoir storage. Storage in Elephant Butte and Caballo is less than 10 percent of average and one-third of that of a year ago. El Vado is nearly empty. Inflow will be above normal but storage rights will be limited.

The water supply outlook for the Carlsbad and Tucumcari areas remains poor due to lack of reservoir storage and drouth in irrigated areas.

COLORADO RIVER. Water supplies will be generally adequate in Western Colorado, Wyoming and New Mexico in 1957. During the winter, snow and rainfall has been above normal at lower elevations. Soil moisture conditions are good in all irrigated valley districts. Water supply outlook along small tributaries is much improved over the past four years. Total seasonal stream flow will exceed normal on all main streams. There was little snow melt during April leaving snow water content as high as 150 percent of normal for May 1. As with other watersheds, stream flow estimates are reduced due to dry mountain soils and a series of drouth years.

Colorado River inflow to Lake Mead is expected to be about 110 percent of normal and well above that for 1956.

NORTH PLATTE. Inflow to Seminoe reservoir will exceed average by at least 20 percent. Storage in the four major reservoirs in Wyoming on the North Platte totals about 850,000 acre feet as compared to about 1,000,000 a year ago. Of this amount about 240,000 acre feet is assigned to the older North Platte project. Kingsley reservoir storage is about three-quarters of that of a year ago. Power production has been curtailed until the start of the irrigation season. With the present storage and expected streamflow on the North Platte, water supply should be reasonably adequate along the main stream. Soil moisture conditions are reported as fair to good.

The flow of the Laramie will be above normal. Lack of storage and poor soil moisture conditions indicate some shortage for the Wheatland irrigated area. Water supply is expected to be some greater than for a year ago.

# STREAMFLOW FORECASTS

### APRIL-SEPTEMBER INCLUSIVE

May 1, 1957

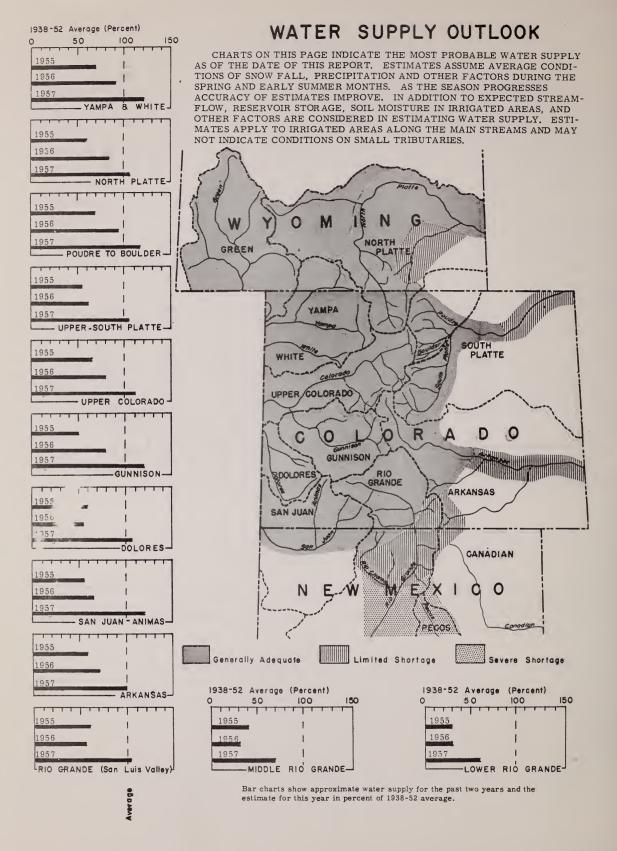
BASIN AND STREAM	1957 Forecast 1000 AF	1957 in. % Avg. 1938-52	15-Yr. Avg. 1938-52	BASIN AND STREAM	1957 Forecast 1000 AF	1957 in. % Avg. 1938-52	15-Yr. Avg. 1938-52
NORTH PLATTE				COLORADO			
Sweetwater at Alcova	86	100	86	Gunnison at Gr. Junction	1750	116	1510
North Platte at Saratoga	700	107	657	San Juan at Rosa, N.M.	900	128	1510
Medicine Bow near Hanna	116	105	111	Piedra at Piedra	280	115	703 215
Laramie at Jelm*	120	114	105*	Los Pinos nr Bayfield *	300	132	215
	120	111	100	Florida nr Durango	80	116	69
			1	Animas at Durango	650	124	522
SOUTH PLATTE			1	La Plata at Hesperus	35	117	30
Poudre at Canon*	250	114	220	Dolores at Dolores	330	105	314
Big Thompson at Drake *	125	112	111	Colorado nr Grand		100	
Saint Vrain at Lyons	110	125	88	Canyon, Arizona	11,000	109	10,069
Boulder at Orodell	70	127	55	•	,	100	10,000
Clear Creek at Golden *	150	106	141	GREEN RIVER			
				Green at Linwood, Utah			1302
ARKANSAS				Little Snake at Lily	350	96	365
Arkansas at Salida *	415	128	323	Elk at Clark	240	112	214
Arkansas at Pueblo *	450	112	401	Yampa at Steamboat Spgs.	325	116	281
Cucharas at La Veta	17	106	16	White at Meeker	425	126	336
Purgatoire at Trinidad	45	79	57				000
S .				RIO GRANDE			
COLORADO				South Fork at South Fork	155	117	132
Colorado nr Granby *	270	136	199	Rio Grande at Del Norte	625	110	565
Willow nr Granby	52	121	43	Alamosa above Terrace Res	90	115	78
Frazer at Granby	115	113	101	Conejos at Mogote	260	118	220
Blue abv Green Mt. Res.	360	118	307	Culebra at San Luis	36	120	30
Colorado at Glenwood Spgs.	<b>*</b> 19 <b>00</b>	123	1540	Inflow to El Vado Res.	300	113	265
Roaring Fork at Glenwood	950	122	777	Costilla at Costilla	30,	88	34
Plateau Creek at Collbran	75	120	62	Rio Grande at Otowi Bridge*	800	94	851
Uncompangre at Colona	160	94	170	Rio Grande at San Marcial*	500	81	619
Surface Cr. nr Cedaredge	20	111	18	Pecos at Pecos	45	73	62
*Including Diversions and S	Storage			**Actual Flow			

## COOPERATIVE SNOW SURVEYS

# SUMMARY OF SNOW MEASUREMENTS

May 1, 1957

WATERSHEDS	No. of Courses	Years of	Water Content as percent of		WATERSHEDS	No. of Courses	Years of	Water Content as percent of	
	Averaged		1956	Avg.	WATERSHEDS	Averaged		1956	Avg.
ARKANSAS RIVER					PLATTE RIVER				
Arkansas River	8	8-21	150	155	Sweetwater	2	17-20	107	133
					North Platte River	10	19-21	134	142
COLORADO RIVER					Laramie River	9	8-21	132	153
Colorado River*	21	8-21	126	157	South Platte River**	3	8-21	154	189
Roaring Fork					Poudre River	7	8-21	111	159
Plateau Creek	2	17-20	174	132	Big Thompson River	3	8-19	128	148
Yampa River	5	21	164	149	St. Vrain River	2	8-21	207	149
White River	2	21	185	194	Boulder Creek	2	7-18	164	164
Gunnison River	9	8-21	187	151	Clear Creek	3	8-21	96	143
Dolores River	4	8-21	245	205					110
Green River (Wyo.)	5	21	122	174	RIO GRANDE				
San Juan River	3	17-21	150	137	Rio Grande (Colo.)	8	8-21	214	187
Animas River	3	20-21	938	250	Alamosa River	2	17-20	162	133
					Conejos River	5	8-21	265	205
*Above Glenwood Sp	nings				** A b D				
Glenwood Sp	TINGS				**Above Denver				



#### WATER SUPPLY OUTLOOK

The bar charts on the opposite page represent graphically the most probable water supply outlook for 1957 as compared to the past two years 1955 and 1956. Streamflow and other factors for 1956 have been partially estimated because full data on water supply conditions are not yet available. Estimates of past conditions and forecasts have been made by the authors of this report. For details on water supply conditions on the Colorado River drainage not shown on this map, reference should be made to state snow reports for Utah and Arizona (See Inside Cover).

YAMPA AND WHITE. Surface water supply along these streams will be adequate for most needs in 1957. Snow pack is near a record high and stream flow will be well above normal.

NORTH PLATTE. Inflow to Seminoe Reservoir will be over 110 percent of normal. Storage in the four major reservoirs on the North Platte in Wyoming now totals about 850,000 ac re-feet as compared to about 1,000,000 acre-feet a year ago. Of this amount about 240,000 acre-feet is assigned to the older North Platte project. Total water available from storage and expected inflow should be reasonably adequate for the irrigated area served by the main stem of the North Platte in Eastern Wyoming and Western Nebraska.

The flow of the Laramie River will be above normal and a year ago. Water supply will be greater than in 1956 but some shortage must be expected for Wheatland area.

POUDRE TO BOULDER. Natural stream flow on these South Platte tributaries will be 10 to 20 percent above normal and about one-third greater than 1956. The bar chart includes water available from the Colorado-Big Thompson project. Natural stream flow and supplemental water should be adequate to meet most needs in the area near the mountains. Precipitation in irrigated areas has provided some opportunity to replenish depleted reservor storage during the peak of snow melt.

UPPER SOUTH PLATTE--CLEAR CREEK. The snow pack on Clear Creek is about 140 percent of normal and similar to a year ago. On the Upper South Platte snow pack is at a record high at 190% of normal. Water supply should be adequate for irrigation on these two streams. A decided improvement should be made in municipal reservoir storage of the City of Denver. Water supply along the Lower South Platte from Kersey to the State line is much improved over that for 1956. Shortages may occur in late season depending upon opportunities to store water and late summer rainfall.

UPPER COLORADO. The flow of the Upper Colorado River and its tributaries will range from 110 to 120 percent of normal for 1957. Water supplies diverted directly from the main streams should be adequate. Snow fall at lower elevations has been much above normal during the winter months and soils in irrigated areas are in good condition. The outlook for the smaller tributary streams is much improved over the past four years.

GUNNISON. Irrigated areas along the Gunnison River and its major tributaries will have adequate water supplies throughout the season. Snow pack is 150 percent of normal. Stream flow will be almost twice that which occurred during the 1956 season.

DOLORES. Water supply outlook on the Dolores River improved materially during April. River flow is now expected to exceed normal. Soil moisture conditions in the irrigated area good. Adequate water supplies should be available for the summer season.

SAN JUAN-ANIMAS. The flow of the San Juan River and its tributaries will be above normal in 1957. Valley soil moisture is excellent. Water supply will be adequate this year.

ARKANSAS. Snow pack on the headwaters of the Arkansas River is 150 percent of average and a year ago. The flow of the Arkansas River should be above normal for a short distance below Pueblo. Soil moisture conditions in the valley areas are good which is in direct contrast to the conditions of the past several years. Water supply outlook is the best since 1952 and would be excellent if water in storage were adequate. Late season water supplies will be dependent on the amount of reservoir storage obtained during the snow melt peak.

RIO GRANDE (San Luis Valley). The water supply outlook for the Rio Grande in San Luis Valley continued to improve during April. Snow pack is about 150 percent of normal for May 1. Stream flow is expected to be **from** 110 to 120 percent of normal. The outlook is much. better than for any year since 1952.

MIDDLE RIO GRANDE (New Mexico). Stream flow through the Middle Rio Grande Valley will approach normal in 1957. The water supply will exceed that available for any year since 1952 but will not fulfill the present water demands. Restrictions on storage will cause shortage during the late summer and fall months.

LOWER RIO GRANDE. Inflow to Elephant Butte will exceed that for any of the past four years. The total inflow and storage will provide about one-half of the normal water use along the river in Southern New Mexico and Western Texas. A continued high groundwater use will be necessary.

#### UTAH

Most of the State has a fair to good water supply outlook for 1957. Short supplies are to be expected on the Virgin River and its tributaries in the southern part of the State.

#### ARIZONA

Surface water supply outlook is far short of demand. On the Salt and Verde Rivers, total water available will forestall any serious crop reduction but heavy use of groundwater will have to be continued. No surface water from snow melt will be available below San Carlos Reservoir. The outlook for the San Carlos project is the poorest for many years.

# SNOW COURSE MEASUREMENTS

May 1, 1957

SNOW COURSE	Snow Dep 1957		er Cont		Years of	SNOW COURSE	Snow Dep 1957	oth Wa	ter Con		Years of
	In Inches	1957	1956		Record	51.0 11 00 01102	In Inches	1957	1956		Record
F	PLATTE RI	VER DI	RAINAG	Æ	**	PI	LATTE R	IVER D	RAINAC	3E	
SWEETWATER RIV	VER					CLEAR CREEK					
Grannier Meadows		19.2	15.7	13.9	20	Loveland Pass	63	22.2	22.9	16.0	21
South Pass*	56	19.0	19.9	14.8	17	Grizzly Peak*	75	26.1	29.4	20.3	15
Larsen Creek	38	15.3	10.6		7	Empire	<b>3</b> 9	12.6	10.9	6.3	8
						Berthoud Falls	63	23.2	16.1		6
NO. PLATTE RIVE		00.4	0.0.0			Clear Creek	71	23.2	24.4		6
Cameron Pass	89	36.1	38.9	24.3	21	COTTONE DE A MINISTER DE	rana n				
Park View	38 67	10.6 29.2	6.4 23.2	7.9	21 21	SOUTH PLATTE R	53	19.6	15.0	12.0	21
Columbine Lodge	51	17.5	14.2	13.5	19	Jefferson Cr.	45	19.6	9.0	12.0 7.5	17
Willow Cr. Pass* Northgate	23	8.0	2.1	13.5	7	Geneva Park	20	6.4	2.1	1.7	8
Bottle Creek	42	18.6	11.0	9.2	20	deneva I alk	20	0.4	2.1	1	· ·
Webber Spring	49	29.6	15.4	16.4	21	ARI	KANSAS I	RIVER	DRAINA	GE	
Old Battle	99	43.3	33.8	34.0	21						
N. French Creek	98	42.8	33.0	32.7	19	ARKANSAS RIVER					
N. Barrett Creek	65	26.2	19.3	22.2	21	Tennessee Pass	40-	13.8	11.2	6.8	21
Ryan Park	34	13.8	4.2	7.9	21	Twin Lakes T.	44	15.7	9.3	9.5	20
Spring Creek	NS	NS				La Veta Pass*	12	5.2	0.0	4.1	21
Albany	46	17.0	12.0		8	4 Mile Park	19	6.5	0.8	0.4	19
_aBonte	2	0.5	0.0		6	Fremont Pass	72	24.0	23.6	18.7	21
Boxelder	18	5.5	1.4		7	Blue Lakes	28	10.5	3.0	7.0	19
						Monarch Pass	73	29.3	17.5	19.3	16
ARAMIE RIVER		00.5	0.5		4.0	Saint Elmo (a)	55	21.0	11.5		7
loach	79	28.5	25.8	21.1	16	Timberline	94	28.5	23.7	20.5	8
Deadman Hill*	68 44	25.0	24.2	17.6	18 <b>8</b>	East Fork	44	14.6	10.3		5
IcIntyre	84	16.3 33.4	12.6 27.8	8.9 23.6	21	Westcliffe Bourbon	21 15	6.9 6.3	0.0 NS		4 1
rooklyn Lake 'ox Park	37	10.1	3.9	5.5	21	Bourbon	10	0.3	149		1
ole Mtn. *	21	6.8	0.0	3.4	20	m	LORADO	RIVER	DR ATN	ACE	•
Libby Lodge	38	13.2	6.3	6.8	21	00		*** * ****	2141114		
Hairpin Turn	46	16.2	13.1	11.4	21	COLORADO RIVER	(Above G	lenwood	d Spring	s)	
Albany	46	17.0	12.0	10.6	8	Cameron Pass*	89	36.1	38.9	24.3	21
OUDDE DUCED						Phantom Valley	33	14.7	8.8	6.8	21
POUDRE RIVER	89	36.1	20 0	24.3	21	Hoosier Pass* Berthoud Pass	53	19.6	15.0	12.0	21
Cameron P. L. Chambers Lake	36	13.9	38.9 9.0	4.4	21	Tennessee Pass	59 40	23.9 13.8	17.4 11.2	15.8 6.8	21 21
Big South	10	3.4	1.4	0.7	21	M. Fork Camp Gr.	30	12.2	5.3	6.6	21
Deadman Hill	68	25.0	24.2	17.6	18	Fiddler Gulch	67	25.2	19.4	16.2	19.
_ake Irene*	78	34.1	30.9	24.5	19	Lulu	70	24.8	25.1	20.0	17
Iour Glass Lake	<b>2</b> 9	10.1	9.7	8.2	17	Willow Creek Pass	51	17.5	14.2	13.5	19
Red Feather	<b>2</b> 9	10.4	5.3	4.1	8	N. Inlet Grand L.	<b>3</b> 9-	15.1	8.6	7.8	19
Lost Lake	49	16.6	13.5		6	Lake Irene	78	34.1	30.9	24.5	19
						Arrow	47.	19.0	8.5	7.8	19
IG THOMPSON RIV						Lapland	41	15.5	10.2	9.0	19
ake Irene*	78	34.1	30.9	24.5	19	Fremont Pass	72	24.0	23.6	18.7	21
idden Valley	55	19.2	15.0	13.8	16	Lynx Pass	44	15.8	6.5	8.5	21
eer Ridge	27 62	9.6 23.5	3.4	4.1	8 <b>6</b>	Shrine Pass	68	24.9	22.9	18.9	15
ongs Peak wo-Mile	71	24.3	16.0 20.7		5	Grizzly Peak	75 23	26.1 8.8	29.4 3.4	20.3	15 10
MO-INITIE	11	44.0	20.1		J	Glen-Mar Ranch Monarch Lake	33	8.8 14.1	9.2	6.6 5.9	9
r. VRAIN RIVER						Granby	30	10.0	4.7	2.4	8
ild Basin	61	23.0	15.3	14.9	21	Grand Lake	23	7.3	7.4	3.9	8
opeland Lake	23	8.6	0.0	6.3	8	Berthoud Summit	85	30.0	24.8		6.
ard	38	14.9	8.4		7	Frazer View	62	20.0	15.8		6
OIII DED CDES						Gore Pass	45	15.6	8.2		6
OULDER CREEK	0.7	20 0	00.5	00.5	1.0	Frisco	35	9.9	8.8		6
niversity Camp loffat	97 57	38.8	23.7	23.7	18	Snake River	38	9.4	9.2		6
onat oulder Falls	57 53	22.8	10.4		7	Summit Ranch	31	11.1	9.6		6
outder Falls	53	19.7	NS		4	Vail Pass	74 42	25.6	23.7 11.5		5 5
						Fando Kokomo	42 54	15.7 18.1	16.8		5
On adjacent drain	nage					Milner	50	19.7	16.7		5
Courses with less		ears re	cord in	period	1938-52	Blue River	39	12.7	NS		
have all years pr						Jones Pass	60	23.7	NS		
S No Survey						Ranch Creek	43	16.4	NS		
) Air observed											

### SNOW COURSE MEASUREMENTS

May 1, 1957

		Snow Depth 1957	Water	Conte	nt	Years of	SNOW COURSE	Snow Depth 1957	Wat	er Cont	ent	Years of
SNOW COUP		n Inches	1957	1956	Avg.	Record	SNOW COURSE	In Inches .	1957	1956	Avg.	Record
	COLO	ORADO RIVI	ER DRAII	NAGE			COI	ORADO RIV	ER DR	AINAGE	 g	
ROARING F	ORK						ANIMAS RIVER					
Ind. Pass Tu		73	27.2	19.1	17.9	21	Silverton Sub. S.	NS	NS	0.0	1.0	21
North Lost		53	22.1	3.2	10.3	21	Ironton Park*	48	17.6	3.2	8.5	20
Nast		18	5.9	1.0	1.4	20	Cascade	32	12.4	0.0	3.5	21
vanhoe	est.	85	30.0	24.0	19.1	11	Spud Mt.	92	37.2	23.7		6
Lift	est.	90	31.0	NS-			Molas Lake	48	18.7	4.2		6
							Howardville	32	12.3	2.9		. 6
AMPA RIV	ER						Mineral Creek	52	19.3	8.5		6
ry Lake		63	26.6	15.5	15.8	21	Red Mt. Pass*	97	34.0	31.0		6
olumbine I	Lodge*	67	29.2	23.2.	20.6	21						
lk River		48	21.7	12,5	12.8	21	DOLORES RIVER					
ynx Pass*		44	15.8	6.5	8.5	21	Rico	16	6.1	0.0	1.4	20
outt Line		94 -	43.1	39.7		6	Telluride	9	3.4	0.0	1.3	21
abbit Ears		93	41.9	30.4		6	Lizard Head	51	24.1	13.0	15.9	20
ampa View	7	40	16.8	4.8		6	Trout Lake	42	18.5	8.3	6.8	8
lat Top		NS	NS	NS			CONTRA DIVIER AND	OMETRICA)				
ear River		38	14.0	6.7		1	GREEN RIVER (WY	33	11.7	4.9	4.2	20
lark		24	10.6	0.0		1	Dutch Joe	33	11.0	8.4	6.5	21
ld Battle *(	(Wyo.)	99	43.3	25.8	33.7	21	Mulligan Park	30	12.2	11.8	6.1	21
							Kendall R.S. Loomis Park	48	18.1	20.2	10.3	21
HITE RIV						0.1		48	19.3	11.9	8.5	21
urro Moun	itain	64	26.3	14.6	15.2	21	Snyder Basin R.S.	59	25.6	18.6	14.0	21
io Blanco		49	23.4	12.3	10.4	21	Piney-LaBarge	38	25.0	10.0	14.0	21
LATEAU (	CREEK							GRANDE DR	AINAG	E		
lesa Lake	s	68	27.4	10.7	15.0	20	RIO GRANDE IN CO	LORADO				
rickle Divi	ide	92	34.4	24.8	31.9	17	Wolf Creek Pass	87	39.4	26.8	28.2	21
							Upper Rio Grande			0.0	2.5	21
UNNISON I							Santa Maria	10	3.4	0.0	1.1	18
rested But	te	36	16.6	2.3	7.3	21	Ft. Garland	0	0	0.0	0.7	17-
ark Cone		50	19.1	10.4	5.8	20	Pyramid	20	8.0	1,6	3, 1	8
lexander L		70	28.5	18.7	24.4	20	Spring Creek Pass	27	11.3	4.7	5.0	8
conton Par		48	17.6	3.2	8.5	20	Pool Table	19	6.8	0.0	1.2	8
rickle Div		92	34.4	24.8	31.9	17	L. Humphreys	3	1.0	0.0	0.1	8 8
ark Reser		83	32.5	20.6	27.4	17	Cochetopa Pass	31	7.1	2.9	1.8	6
orphyry C	reek	74	28.6	16.9	17.9	17	Red Mt. Pass	97	34.0	31.0 3.6		6
annah Cr.		NS	N'S	NS 2.1	2, 8	9	Porcupine	29	11.2 44.9	34.5		6
ake City	Dogg*	27	11 9	4.7	5.0	8	Wolf Creek Summit	111 104	40.7	30.7		
pring Cr. ochetopa F		31	11.3 7.1	2.9	1.8	8	Hiway Pass Creek	29	11.6	0.7		
ocnetopa F IcClure Pa		56	25, 2	5.0	1.0	7	rass creek	20	11,0	0. 1		
ed Mt. Pa		97	25. Z 34. 0	31.0		6	ALAMOSA RIVER					
lue Mesa	35	97 27	10.3	NS			Silver Lakes	7	1.9	0.0	1.1	20
		21	10. 3	110			Summitville	94	31.1	20.4	23.7	17
AN JUAN I olf Creek		87	39.4	26.8	28, 2	21	CONEJOS RIVER					
pper San J		98	39.4 45.0	29.3	32, 8	21	River Springs	12	5.3	0.0	1.0	20
ranite Pea		98	0.0	0.0	0.8	17	Cumbres Pass	61	32.1	10.0	17.2	21
ramte Pea a Plata	rv 2	51	21.0	2.2		7	Platoro	57	23.6	8.5	9.5	8
olf Creek	Summit		44.9	34.5		6	West Conejos	19	6.8	0.0	4.4	8
hama Divi	do*	NS NS	44.9 NS	34.5			La Manga	80	27.0	17.3	14.2	8
hamita*	ue-	8	3.7									
		0	3, 1				SANGRE DE CRISTO	O RANGE (C				
On adjace	ent drain	12 00					LaVeta Pass	12	5.2	0.0	4.1	21
* Courses	with lee	s than 15 ye	ars reco	rd in ne	eriod 1	938-52	Culebra	28	9.8	0.0	9.7	17
		rior to 1953										
un	Jours p.		a, crase				NS - No Survey					

NS - No Survey

# STATUS OF RESERVOIR STORAGE May 1, 1957

	USABLE		A.F. Sto			USABLE		A.F. Stor	
RESERVOIR	CAPACITY		15-yr.Avg.		RESERVOIR	CAPACIT			15-yr. Avg
	1000 A.F.	1957	1956	1938-52		1000 A.F	. 1957	1956	1938-52
NO	RTH PLATTE	DRAIN	AGE			ARKANSAS	DRAINA	3E	
Kingsley	1900.0	718.0	923.4	1219.5*	Twin Lakes	54.4	9.1	12.5	21.4
Sutherland	70.0	70.0	52.7	47.7	Sugar Loaf	17.4	4.5	6.5	8. 0
Minatare	58.8	22.1	32.3	41.0	Clear Creek	11.4	5.4	4.3	4. 2
Alcova	190.5	187.7	187.6	132.2	Meredith	41.9	0.0		17.1
Seminoe	981.8	241.0	283.7	338.5*	Horse Creek	26.9	0.0		9.2
Guernsey	39.8	23.9	15.1	36.3	Adobe Creek	61.6	0.0		25.7
Pathfinder	1011.0	417.9	549.4	493.4	Cucharas	40.0	0.8		5.9
					John Martin	655.0	0.0		67. 2
SOU	TH PLATTE	DRAIN	AGE		Great Plains	150.0	0.0		55.2
Windsor	18,6	. 11.5	8. 2	12.9	Model	15.0	0.7		4.2
Cache la Poudre	9.5	6.7	6.0	7:9	Conchas(NM)	600.0	41.5	236.4	272.8
Fossil Creek	11.6	4.3	4.1	8.6		COLORADO I			412.0
Terry Lake	8.2	4.3	5.7	5.1	Taylor Park	106.2	29.0		70.6
Halligan	6.4	3.4	1.9	2. 2	Vallecito	126.3	38.2	60.7	42.9
Chambers Lake	8.8	2.3	2.6	3.1	Groundhog	21.7	3.0		
Cobb Lake	34.3	0.7	0.0	4.6	Granby	467.5	-	5,6.	.11.4
Black Hollow	8.0	2.4	0.0	3.3	Green Mountain	146.3	25.5	24.9	139.6
Horsetooth	143.5			J. J	Lake Mead		31.8	33.2	55.1
Lake Loveland	143.5	108.9	85.4			688.0		10,748.0	
	- •	9.3	7.2	6.1	Lake Havasu	•	678.4	659.9	571.3*
Boyd Lake	44.0	5.9	8.1	16.8	Lake Mohave	1,810.3		1,769.7	
Lone Tree	9.2	8.3	8.6	8.3		RANDE (COL	•		
Mariano	5.4	5.4	1.7	3.3	Rio Grande	45.8	6, 1	6.5	16,5
Carter	112.4	76.8	<b>5</b> 8. <b>0</b>	*	Santa Maria	45.0	3.6	3. 1	11.0
Union	12.7	4.1	1.7	7.5	Sanchez	103.2	7.4	13.0	15.4
Eleven Mile	81.9	23.7	24.4	75.8	Terrace	17.7	2.5	2,9	4.7
Cheesman	79.0	39.6	29.8	60.4	Continental	26.7	3.8	3.7	8.9
Marston	18.9	16.4	12.2	15.8	Platoro	60.0	1.0	0,0	*
Antero	33.0	0.0	0.0	15.2		GRANDE (N. 1	A.) DRAI	NAGE	
Barr Lake	32.2	19.0	17.4	23.9	Elephant Butte	2,273.7	52.2	164.6	870.3
Milton	24.4	2.3	2.3	14.4	Caballo	365.0	3.7	5.5	142.1
Standley	18.5	7.8	9.0	14,0	El Vado	226.0	2.7	9.0	104.1
Marshall	10.3	3.6	1.8	4.8	Alamogordo	128.0	6.2	84.9	46.2
Horse Creek	20.6	1.2	12.0	10.3	McMillan-Avalor	n 37.0	5.1	19.9	12.0
Riverside	57 <b>:5</b>	50.0	27.3	50.1	SAI	LT AND GILA	DRAIN	GE	
Empire	37.7	23.9	16.4	31. 1	Roosevelt	1,382.0	147.1	200.2	556.3
Jackson Lake	35.4	34.5	33.2	34.4	Horse Mesa	245.1	199.6	241.5	207.1
Prewitt	32.8	0	0.0	23,9	Mormon Flat	58.0	41.9	56.5	48.6
Point of Rocks	70.0	44.6	45.0	61.2	Saguaro	70.0	52.3	67.8	50.5
Julesburg	28, 2	22.7	21.2	22.3	Bartlett	180.0	166.0	63.8	85. 1*
					Horseshoe	143.0	0	2.2	31.0*
r e					Carl Pleasant	163.8	24.6	26.8	35.7
					San Carlos	1,205.0	0	36.0	198.6
								00.0	100.0

# VALLEY PRECIPITATION1

# Division Averages and Departures3/

	Fa	111	W	inter
DRAINAGE	SeptC	OctNov.	Dec. t	hru March
DIVISIONS	Avg.	Dept.	Avg.	Dept. 2/
North Platte River, Wyo.	2.16	-1.72	3.02	-0.33
South Platte River	2.98	-1.39	2.85	-0.13
Arkansas River	3,52	-2.42	3, 19	f .02.
Colorado River	3.18	-2.18	7.76	<b>/2.03</b>
Green River, Wyo.	1.55	-1.43	2.40	-0.03
San Juan River, N.M.	1.74	- 3, 53	4.91	£1.42
Colorado River, Ariz	2.80	-3.40	4.57	<b>/0.92</b>
Gila River, Arizona	0.91	-2.73	2.79	<b>∤0.55</b>
Canadian River, N. M	2.28	-4.49	2.65	7.08
Rio Grande, Colorado	2.05	-2.26		
Rio Grande (N), N. M.	2.27	-4.02	5.26	<i>f</i> .89
Rio Grande (S), N. M.	1.80	-2.72	1.62	13
Pecos River, N. M.	2.72	-4.12	3.07	/ .31

<sup>1/</sup> Preliminary analysis by U.S. Weather Bureau from data furnished by Meteorological Service & U.S. Weather Bureau

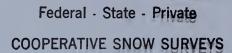
### SOIL MOISTURE MEASUREMENTS

STATION	Percent Available Soil Moistus on May 1					
	1957	1956	1955			
NORTH PLATTE						
Columbine Lodge	21	61	38			
Willow Creek	31	46	88			
SOUTH PLATTE						
Red Feather	53	27	116			
Chambers Lake	20	91	32			
Deer Ridge	16	125	65.			
Hidden Valley	52	41	70			
Longs Peak	41	95	101			
University Camp	10	110	115			
Berthoud Falls	0	23	20			
ARKANSAS						
Leadville	40	99	51			
UPPER COLORADO						
Vail Pass	56	100	101			
ROARING FORK						
Placita	111	97				
Maroon	76	90	103			
RIO GRANDE (Colorado)						
Bristol View	4	5,5	23			
Wolf Creek Pass	24	<b>7</b> 9	49			
River Springs	118	132	5 <sub>.</sub>			
RIO GRANDE (N. M.)						
Red River						
Tres Ritos						
Tres Piedras						

<sup>2/</sup> Departure from average

<sup>3/</sup> Selected Stations





Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"